Application No. 10/575,319
Responsive to the office action dated June 8, 2009

REMARKS

Favorable reconsideration of this application is requested in view of the following remarks.

Claims 1-14 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Asanuma et al. (U.S. Patent No. 6,001,139) in view of Kato et al. (Japanese Patent Application Publication No. 2001-135352), and in further view of Harada et al. (U.S. patent No. 5,597,664). Applicants respectfully traverse this rejection.

Applicants note that Keiichi KATO is the first listed inventor of JP 2001-135352 (hereinafter referred to as "Kato") and that Yoshiaki NITTA is listed as the third inventor thereof.

This rejection relies on Kato's disclosure of an Al, Mg, and Si alloy constituting a positive electrode collector (see abstract), and Harada's disclosure of a composition of an eutectic alloy formed at not higher than the melting point of Al, i.e., 660.37 °C (see abstract).

Kato discloses a nonaqueous electrolyte secondary battery including a collector formed of the Al, Mg, and Si alloy for a positive electrode (see abstract and para. [0015]). Kato, however, does not disclose the average composition obtained by arranging a ratio of elements composing the collector in a direction of thickness of the collector is equal to a composition of an alloy whose liquidus temperature is 630 °C or lower as claim 1 recites, and Kato does not remedy the deficiencies of Asanuma for this feature.

Harada discloses a porous metal body that is obtained by coating a skeleton foamed resin such as urethane foam with one or more metals that are capable of forming a eutectic alloy at a temperature not higher than the melting point of Al, i.e., 660.37 °C, (see coln. 4, lines 12-24), and by further coating the coated porous foamed resin with a paste including powdery Al, powdery mixture of Al and one or more metals, powder of an alloy of Al and the one or more metals, or a mixture of the powdery Al and the alloy (see coln. 4, lines 12-47). The second coating is conducted by immersing the coated resin in a paste including powdery Al, a powdery mixture of Al and the one or more metals, powder of an alloy of Al and the one or more metals, or a mixture of the powdery Al and

the alloy (see *id.*). About the one or more metals included in the first and second coatings, Harada merely discloses a list of metals including Mg and Si (see coln. 4, lines 21-24 and 40-47) and amounts of the metals in the first coating film as g/m^2 and the second coating as wt. % in the paste (see table 5 in coln. 10). As shown in table 1 of the specification, the liquidus temperature of the collector composition varies depending on a type of a metal included in the collector composition such as Mg or Si and a concentration of the metal in the composition (see page 16 of the specification). When Mg or Si is included in the collector composition, the composition including Mg in an amount of 5.5-96.0 wt. % or Si in an amount of 5.1-16.3 wt. % only satisfies the feature of the liquidus temperature of 630 °C or lower as claim 1 recites (*id.*).

In Harada, sample 8 discloses inclusion of Si in the porous metal body among samples, but sample 8 would not provide the collector of claim 1 for the following reasons: Harada discloses a porous metal body of example 1 (sample 1), which is coated with Cu in an amount of 5 g/m^2 that provides Cu on the foam in an amount of 3.5 wt. % (see table 3 in coln. 7, coln. 6, line 64 – coln. 7, line 23, and coln. 7, lines 41-44). Sample 8 in example 3 of Harada is a porous metal body coated with Si in an amount of 4 g/m^2 and is obtained by a same method as that of example 1 except for the metal element, but Harada is silent about the wt. % silicon concentration (see table 5 in coln. 10). The amount of Si on the foam may be calculated from the ratio of 5 g/m^2 of Cu coating in sample 1 and 4 g/m^2 of Si coating in sample 8 and the disclosed Cu amount in sample 1 of 3.5 wt. %, and would be 2.8 wt. % (= 3.5 wt. % x 4/5). When silicon is the one element other than Al of claim 1, the content of silicon must be in a range of 5.1-16.3 wt% to allow the liquidus temperature to be 630 °C or lower as claim 1 recites (see page 4, lines 21-26 of the specification). Even if the total layers of the first and second coatings were similar to the collector of claim 1, the 2.8 wt. % concentration of Si in sample 8 of Harada is much lower than 5.1 wt. %, and the total layers of the first and second coatings of Harada would not have the liquidus temperature of 630 °C or lower (see *id.*). Thus, Harada fails to disclose the particular composition of the collector in which the average composition obtained by averaging a ratio of elements composing the collector in a direction of thickness of the collector is equal to a composition of an alloy

whose liquidus temperature is 630 °C or lower as claim 1 recites and does not remedy the deficiencies of Asanuma and Kato.

In addition, with respect to claims 3 and 5, the collector includes a layer containing the other element(s) and an Al layer disposed on both sides of the layer including the other element(s) (claim 3), and an Al layer and layers containing the other element(s) disposed on both sides of the Al layer (claim 5). Kato, however, discloses a collector including an alloy foil that contains at least Al, Mg, and Si (see para. [0015]), and fails to disclose the configurations of the collector of claims 3 and 5 as discussed above. Thus, claims 3 and 5 are further removed from Asanuma in view of Kato, and further in view of Harada.

With respect to claims 7-9, Asanuma does not disclose a collector included in the positive electrode in which Mg, Si, or a total of Al, Mg, and Si contents are 5.5-96.0 wt. %, 5.1-16.3 wt. %, and at least 99.5 wt. % in the average composition as claims 7-9 require, respectively. Asanuma discloses an auxiliary layer arranged on the negative electrode sheet that includes electrically conductive particles in an amount of 2.5-96 wt. % (see coln. 4, lines 51-62). Thus, Asanuma fails to disclose a collector that is included in a positive electrode and includes the particular contents of Mg, Si, or the total of Al, Mg, and Si as claims 7-8 and 9 recite, respectively. Further, with respect to claim 9, Asanuma discloses cordierite ($2MgO.2Al_2O_3.5SiO_2$) as inorganic particles to be included in insulating-type protective layers on the positive electrode (see coln. 6, lines 4-35) and fails to disclose the collector that is included in the positive electrode and includes Al, Mg, and Si as claim 9 requires. Thus, the rejection misapprehends the relevance of Asanuma to the features of claims 7-9, and claims 7-9 are further removed from Asanuma in view of Kato, and further in view of Harada..

Accordingly, claim 1 and claims 2-14, which ultimately depend from claim 1, are distinguished from Asanummuna in view of Kato, and further in view of Harada, and this rejection should be withdrawn.

The English translation of the International preliminary Report on Patentability of the present application is filed herewith for the Examiner's reference.

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In view of the above, Applicants request reconsideration of the application in the form of a Notice of Allowance.

Respectfully submitted,

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